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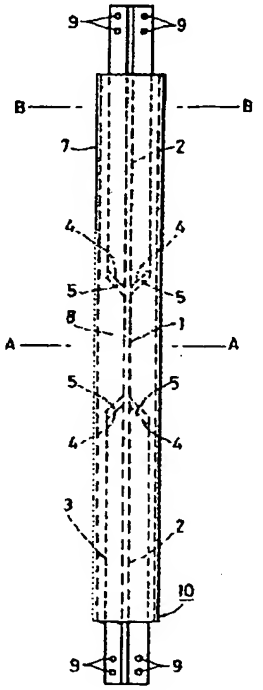
(54)【発明の名称】　座屈拘束筋かい部材

(57)【要約】
【目的】　座屈拘束筋かい部材の剛性および降伏耐力を任意に設定することができ、かつ鋼製中心軸力部材の応力の流れをよくする。
【構成】　小断面部材１の長手方向の両端部に大断面部材２を連設して鋼製中心軸力部材３を構成し、前記大断面部材２における小断面部材側の端部に、小断面部材１に対し鈍角を形成する斜面４を設け、前記斜面４に変形吸収用弾性材５を固定し、前記鋼製中心軸力部材３におけるコンクリートに埋設される部分に付着防止被膜６を設け、前記変形吸収用弾性材５および付着防止被膜６を設けた鋼製中心軸力部材３における端部を除く部分を、鋼管７内に挿通し、その鋼管７と変形吸収用弾性材５および付着防止被膜６を有する鋼製中心軸力部材３との間に、コンクリート８を充填する。



1

【特許請求の範囲】

【請求項１】　小断面部材１の長手方向の両端部に大断面部材２を連設して鋼製中心軸力部材３を構成し、前記大断面部材２における小断面部材側の端部に、小断面部材１に対し鈍角を形成する斜面４を設け、前記斜面４に変形吸収用弾性材５を固定し、前記鋼製中心軸力部材３におけるコンクリートに埋設される部分に付着防止被膜６を設け、前記変形吸収用弾性材５および付着防止被膜６を設けた鋼製中心軸力部材３における端部を除く部分を、鋼管７内に挿通し、その鋼管７と変形吸収用弾性材５および付着防止被膜６を有する鋼製中心軸力部材３との間に、コンクリート８を充填した座屈拘束筋かい部材。

【発明の詳細な説明】

【０００１】

【産業上の利用分野】本発明は、建築物その他の構造物において、地震力や風力等の水平力に抵抗させる構造要素として使用する座屈拘束筋かい部材に関するものである。

【０００２】

【従来の技術】従来、座屈拘束筋かい部材としては、実公平４－１９１２１号公報により公表されているものが知られており、また構造物に対する座屈拘束筋かい部材の取付例についても、種々の型式のものが提案されている。

【０００３】

【発明が解決しようとする課題】前記従来の座屈拘束筋かい部材の場合は、座屈拘束時における可変剛性および可変降伏耐力筋かい部材を適当値に設定できないという欠点がある。また、筋かい部材の断面性能は細長比により決定されるので、筋かい部材による地震力負担率を調整する自由度が少なく、そのため設計が繁雑になる。特に保有耐力設計においては、柱，梁部材よりも耐震部材である筋かい部材を先に降伏させるように構成することが望ましいが、前述の理由でこのような設計を行なうことが極めて困難である。さらに圧縮力により筋かい部材が降伏したのちの座屈性状については不明確であり、従来の座屈拘束材では塑性座屈を防止することが困難である。また従来の筋かい部材は振動減衰効果を期待することができない。また建築物の崩壊のメカニズムおよび振動性状を制御するためには、筋かい部材の剛性および降伏耐力（ヒステリシスカーブ）を自由にコントロールすることが必要であるが、そのような筋かい部材は、現存しない。

【０００４】

【課題を解決するための手段】前述の課題を有利に解決するために、本発明の座屈拘束筋かい部材においては、小断面部材１の長手方向の両端部に大断面部材２を連設して鋼製中心軸力部材３を構成し、前記大断面部材２における小断面部材側の端部に、小断面部材１に対し鈍角

2

を形成する斜面４を設け、前記斜面４に変形吸収用弾性材５を固定し、前記鋼製中心軸力部材３におけるコンクリートに埋設される部分に付着防止被膜６を設け、前記変形吸収用弾性材５および付着防止被膜６を設けた鋼製中心軸力部材３における端部を除く部分を、鋼管７内に挿通し、その鋼管７と変形吸収用弾性材５および付着防止被膜６を有する鋼製中心軸力部材３との間に、コンクリート８を充填する。

【０００５】

【実施例】図５ないし図９は本発明の第１実施例において用いられる変形吸収用弾性材５および付着防止被膜６を有する鋼製中心軸力部材３を示すものであって、平板状の小断面部材１の長手方向の両端部に、十字状断面の大断面部材２が連設され、かつ前記大断面部材２における小断面部材側の端部に、小断面部材１に対し鈍角を形成する斜面４が設けられて、鋼製中心軸力部材３が構成され、合成樹脂スポンジまたはゴムからなる変形吸収用弾性材５が、前記斜面４に対し接着剤等により固定され、かつ鋼製中心軸力部材３におけるコンクリートに埋設される部分に、型枠剥離剤，オイルペイント，アスファルト等からなる付着防止被膜６が塗布され、さらに大断面部材２における小断面部材１と反対側の端部に、複数のボルト挿通用透孔９が設けられている。

【０００６】図１ないし図４は本発明の第１実施例に係る座屈拘束筋かい部材を示すものであって、変形吸収用弾性材５および付着防止被膜６を有する鋼製中心軸力部材３における両端部を除く部分が、鋼管７内に挿通され、その鋼管７と、変形吸収用弾性材５および付着防止被膜６を有する鋼製中心軸力部材３との間に、コンクリート８が充填されて、座屈拘束筋かい部材１０が構成されている。

【０００７】前記鋼製中心軸力部材３における大断面部材２の部分の断面積をA_1，小断面部材１の部分の断面積をA_2，小断面部材１の部分の長さをL_2，鋼製中心軸力部材３の部分の長さをL_1とすると、座屈拘束筋かい部材の剛性Ｒおよび降伏耐力Ｐ，を次式で表わすことができる。

$$R=\frac{E}{\frac{L_1-L_2}{A_1}+\frac{L_2}{A_2}}$$

$P_y=\sigma_y \cdot A_2$

Ｅ：ヤング係数

σ_y：鋼の降伏応力度

前記式により、鋼の応力度に制限があっても、Ｒ，Ｐ，を自由に変化させることができるので、設計および振動性状の観点からも非常に有利である。

【０００８】図１０および図１１は本発明の第１実施例に係る座屈拘束筋かい部材の使用状態を示すものであっ

て、鉄骨構造物における上下の梁１１に十字状の鋼製取付金具１２が溶接により固着され、その鋼製取付金具１２と前記鋼製中心軸力部材３の端部とは、鋼製継手板１３およびボルト１４により連結されている。

【０００９】図１２ないし図１４は本発明の第２実施例に係る座屈拘束筋かい部材を示すものであって、平板状の小断面部材１と平板状の各大断面部材２とからなる鋼製中心軸力部材３が用いられ、前記各大断面部材２における小断面部材側の端部に設けられた斜面４に変形吸収用弾性材５が固着されているが、その他の構成は第１実施例の場合と同様である。

【００１０】図１５ないし図１７は本発明を実施する場合に使用できる鋼製中心軸力部材３の他の例を示すものであって、H形鋼材からなる鋼製中心軸力部材３における各フランジ１７の長手方向の中間部に、台形の切欠部１８が設けられて、鋼製中心軸力部材３の中間部に位置する小断面部材１および斜面４と、大断面部材２とが設けられている。

【００１１】

【発明の効果】本発明によれば、小断面部材１の長手方向の両端部に大断面部材２を連設して鋼製中心軸力部材３を構成し、前記大断面部材２における小断面部材側の端部に、小断面部材１に対し鈍角を形成する斜面４を設け、前記斜面４に変形吸収用弾性材５を固定し、前記鋼製中心軸力部材３におけるコンクリートに埋設される部分に付着防止被膜６を設け、前記変形吸収用弾性材５および付着防止被膜６を設けた鋼製中心軸力部材３における端部を除く部分を、鋼管７内に挿通し、その鋼管７と変形吸収用弾性材５および付着防止被膜６を有する鋼製中心軸力部材３との間に、コンクリート８を充填したので、座屈拘束筋かい部材の可変剛性および可変降伏耐力を任意に設定することができ、かつ前記斜面４は小断面部材１に対し鈍角を形成しているので、小断面部材１と大断面部材２の間の断面積は徐々に変化し、そのため応力の流れをよくすることができる。

【図面の簡単な説明】

【図１】本発明の第１実施例に係る座屈拘束筋かい部材を示す側面図である。

【図２】本発明の第１実施例に係る座屈拘束筋かい部材を示す正面図である。

【図３】図１のＡ－Ａ線拡大断面図である。

【図４】図１のＢ－Ｂ線拡大断面図である。

【図５】本発明の第１実施例において用いられる変形吸収用弾性材付き鋼製中心軸力部材を示す側面図である。

【図６】図５に示す鋼製中心軸力部材を示す正面図である。

【図７】図５の中間部を拡大して示す側面図である。

【図８】図７のＣ－Ｃ線拡大断面図である。

【図９】図７のＤ－Ｄ線拡大断面図である。

【図１０】座屈拘束筋かい部材使用状態を示す側面図である。

【図１１】図１０の一部を拡大して示す側面図である。

【図１２】本発明の第２実施例に係る座屈拘束筋かい部材を示す側面図である。

【図１３】図１２のＥ－Ｅ線拡大断面図である。

【図１４】図１２のＦ－Ｆ線拡大断面図である。

【図１５】本発明の実施例において使用できる鋼製中心軸力部材の他の例を示す側面図である。

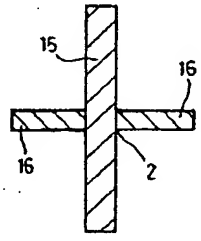
【図１６】図１５のＧ－Ｇ線拡大断面図である。

【図１７】図１６のＨ－Ｈ線拡大断面図である。

【符号の説明】

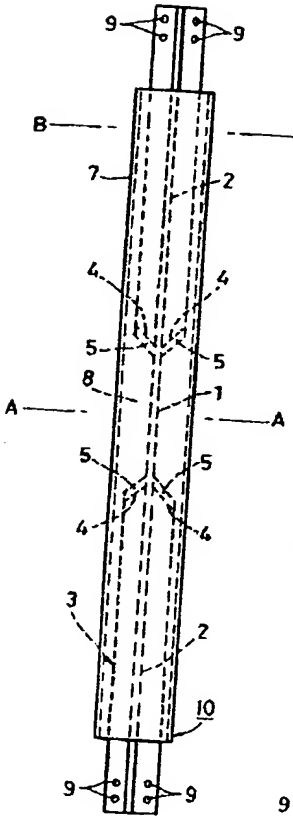
１　小断面部材
２　大断面部材
３　鋼製中心軸力部材
４　斜面
５　変形吸収用弾性材
６　付着防止被膜
７　鋼管
８　コンクリート
９　ボルト挿通用透孔
１０　座屈拘束筋かい部材
１１　梁
１２　鋼製取付金具
１３　鋼製継手板
１４　ボルト
１５　平板部
１６　リブプレート
１７　フランジ
１８　切欠部

【図８】



【図９】

【図1】



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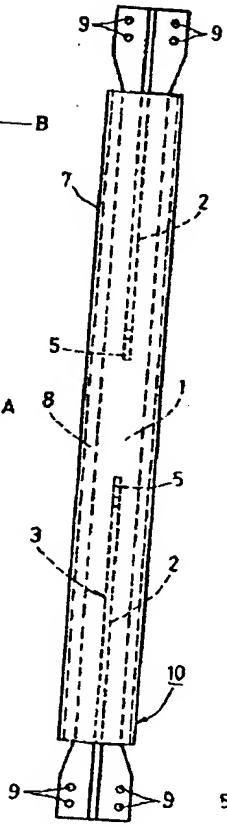

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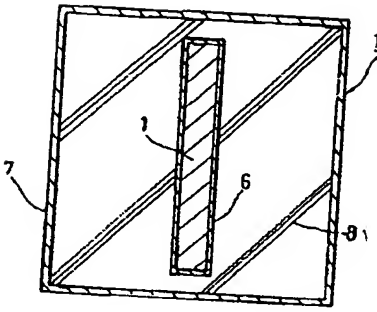

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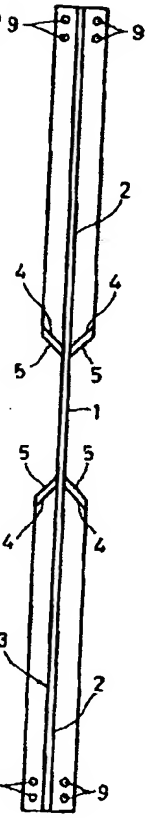

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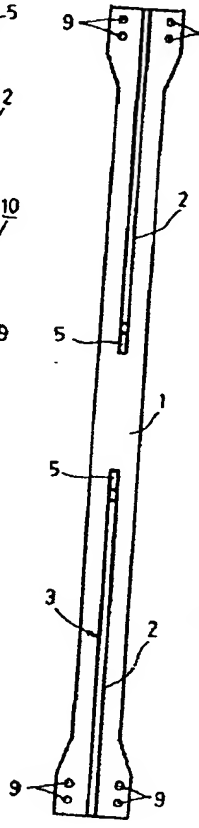

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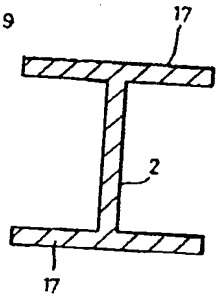

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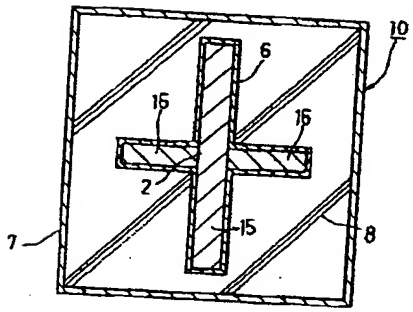

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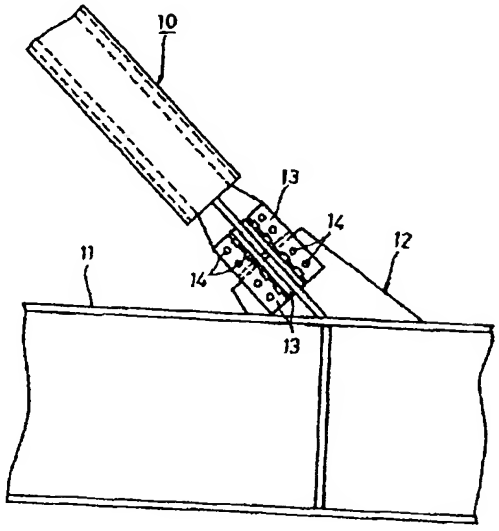

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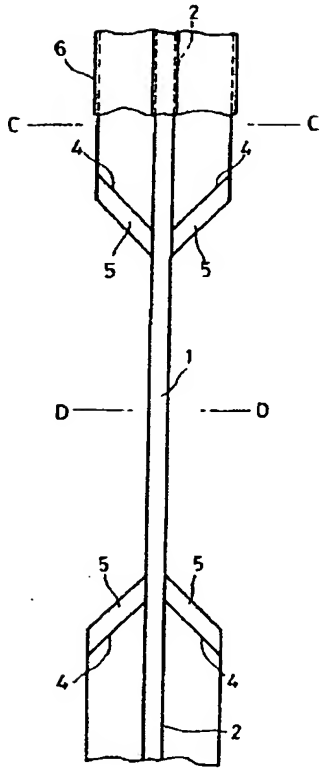

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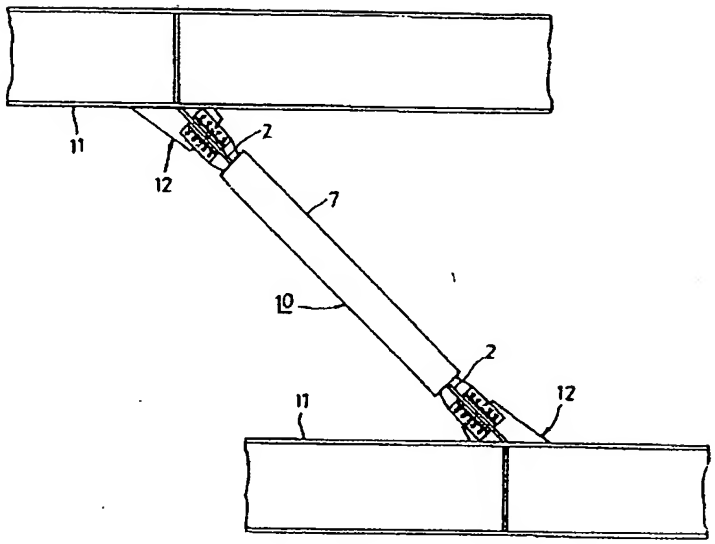

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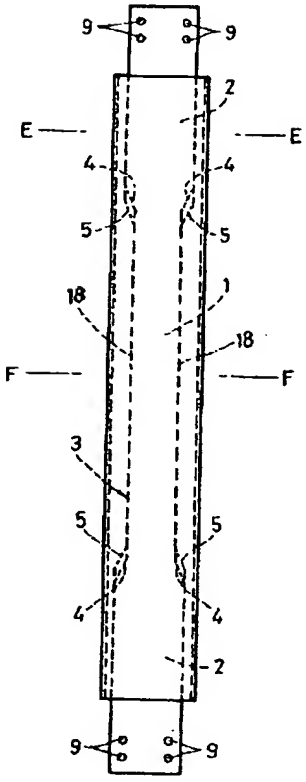

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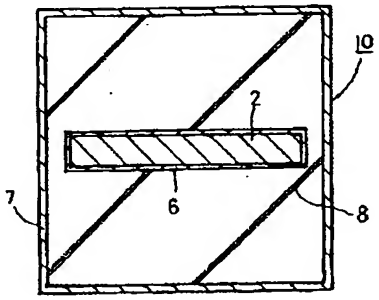

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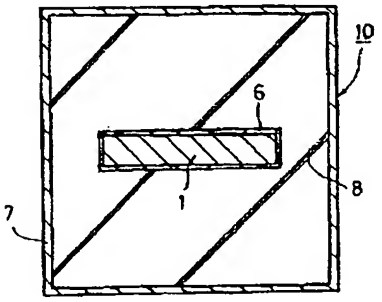
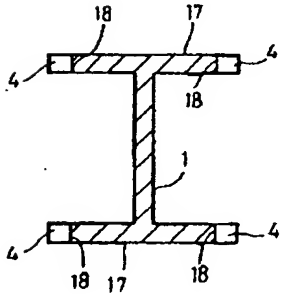


【図17】



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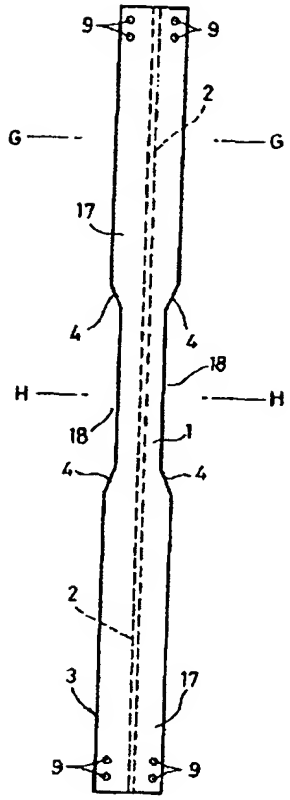

(19) **JAPANESE PATENT OFFICE (JP)**

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	E 04 H 9/02	311			

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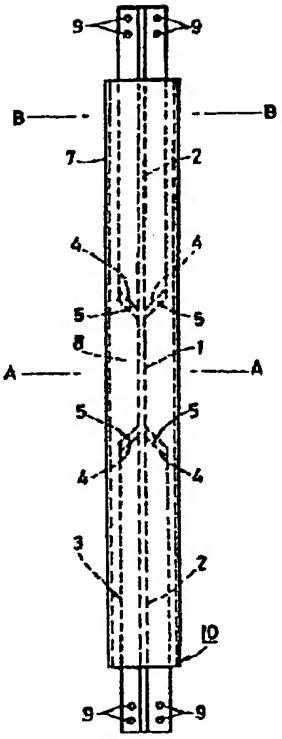
(54) **[Title of the Invention]**

BUCKLING CONFINED DIAGONAL BRACE MEMBER

(57) **[Abstract]**

[Object] The object of the present invention is to allow the arbitrary setting of the rigidity and yield proof stress of a buckling confined diagonal brace member, and to improve the flow of stress in a center-axial force member made of steel.

[Constitution] A steel center-axial force member 3 is constructed by connecting large-cross-sectional members 2 to both end portions of a small-cross-sectional member 1. Inclined surfaces 4 that form an obtuse angle with respect to the small-cross-sectional member 1 are formed on the end portions of the aforementioned large-cross-sectional members 2 that are located adjacent to the small-cross-sectional member, and a deformation-absorbing elastic material 5 is fastened to the aforementioned inclined surfaces 4. An adhesion-preventing covering film 6 is formed on the portions of the aforementioned steel center-axial force member that are to be embedded in concrete. Then, the steel center-axial force member 3 on which the aforementioned deformation-absorbing elastic material 5 and adhesion-preventing cover film 6 have been installed is passed through a steel tube 7 (except for the end portions of said member 3), and the space between the steel tube 7 and the steel center-axial force member 3 which has the [abovementioned] deformation-absorbing elastic material 5 and adhesion-preventing covering film 6 is filled with concrete 8.



[Claims]

[Claim 1] A buckling confined diagonal brace member in which [i] a steel center-axial force member 3 is constructed by connecting large-cross-sectional members 2 to both end portions of a small-cross-sectional member 1, [ii] inclined surfaces 4 that form an obtuse angle with respect to the small-cross-sectional member 1 are formed on the end portions of the aforementioned large-cross-sectional members 2 that are located adjacent to the small-cross-sectional member, [iii] a deformation-absorbing elastic material 5 is fastened to the aforementioned inclined surfaces 4, [iv] an adhesion-preventing covering film 6 is formed on the portions of the aforementioned steel center-axial force member that are to be embedded in concrete, [v] the steel center-axial force member 3 on which the aforementioned deformation-absorbing elastic material 5 and adhesion-preventing cover film 6 have been installed is passed through a steel tube 7 except for the end portions of said member 3, and [vi] the space between the steel tube 7 and the steel center-axial force member 3 which has the [abovementioned] deformation-absorbing elastic material 5 and adhesion-preventing covering film 6 is filled with concrete 8.

[Detailed Description of the Invention]

[0001]

[Field of Industrial Utilization] The present invention relates to a buckling confined diagonal brace member which is used as a structural element that resists horizontal forces such as seismic forces and wind forces in building constructions and other structures.

[0002]

[Prior Art] Conventionally, the member disclosed in Japanese Utility Model Application Kokoku No. 4-19121 has been known as a buckling confined diagonal brace member. Furthermore, various types of attachments have been proposed as examples of the attachment of buckling confined diagonal brace members to structures.

[0003]

[Problems to Be Solved by the Invention] In the case of the abovementioned conventional buckling confined diagonal brace member, the following drawback arises: specifically, a diagonal brace member with variable rigidity and a variable yield proof stress during buckling confinement cannot be set at appropriate values. Furthermore, since the cross-sectional performance of the diagonal brace member is determined by the aspect ratio [Tr's note: uncertain term], there is little degree of freedom in adjusting the seismic force loading rate of the diagonal brace member; accordingly, design is complicated. Especially in the case of retained proof stress design [Tr's note: uncertain term], it is desirable to construct diagonal brace members, which are more seismic-resistant members than columns or girder members, so that these diagonal brace members are caused to yield before such columns or girder members; however, for the reasons mentioned above, such design is extremely difficult. Furthermore, the buckling properties of diagonal brace members following the yielding of such members due to compressive forces are not clearly defined, so that it is extremely difficult to prevent plastic buckling in the case of conventional buckling confined members. Moreover, a vibration attenuating effect cannot be expected in conventional diagonal brace members. Furthermore, in order to control the failure mechanisms and vibrational properties of

building constructions, it is necessary to achieve free control of the rigidity and yield proof stress (hysteresis curve) of diagonal brace members; however, such diagonal brace members do not exist.

[0004]

[Means Used to Solve the Abovementioned Problems] In the buckling confined diagonal brace member of the present invention, in order to solve the abovementioned problems in an advantageous manner, [i] a steel center-axial force member 3 is constructed by connecting large-cross-sectional members 2 to both end portions of a small-cross-sectional member 1, [ii] inclined surfaces 4 that form an obtuse angle with respect to the small-cross-sectional member 1 are formed on the end portions of the aforementioned large-cross-sectional members 2 that are located adjacent to the small-cross-sectional member, [iii] a deformation-absorbing elastic material 5 is fastened to the aforementioned inclined surfaces 4, [iv] an adhesion-preventing covering film 6 is formed on the portions of the aforementioned steel center-axial force member that are to be embedded in concrete, [v] the steel center-axial force member 3 on which the aforementioned deformation-absorbing elastic material 5 and adhesion-preventing cover film 6 have been installed is passed through a steel tube 7 except for the end portions of said member 3, and [vi] the space between the steel tube 7 and the steel center-axial force member 3 which has the [abovementioned] deformation-absorbing elastic material 5 and adhesion-preventing covering film 6 is filled with concrete 8.

[0005]

[Embodiments] Figures 5 through 9 show a steel center-axial force member 3 with a deformation-absorbing elastic material 5 and an adhesion-preventing covering film 6 in a first embodiment of the present invention. Large-cross-sectional members 2 with a cruciform cross section are connected to both end portions (with respect to the direction of length) of a flat-plate-form small-cross-sectional member 1, and inclined surfaces 4 that form an obtuse angle with respect to the small-cross-sectional member 1 are formed on the end portions of the aforementioned large-cross-sectional members 2 that are adjacent to the small-cross-sectional member, so that a steel center-axial force member 3 is constructed. A deformation-absorbing elastic material 5 consisting of a synthetic resin sponge or rubber is fastened to the aforementioned inclined surfaces 4 by means of an adhesive agent, etc., and the portions of the steel center-axial force member 3 that are to be embedded in concrete are coated with an adhesion-preventing covering film 6 consisting of a mold frame stripping agent, oil paint or asphalt, etc. Furthermore, a plurality of through-holes 9 for the passage of bolts are formed on the opposite end portions of the large-cross-sectional members 2 from the small-cross-sectional member 1.

[0006] Figures 1 through 4 show a buckling confined diagonal brace member constituting a first embodiment of the present invention. Here, a steel center-axial force member 3 which has a deformation-absorbing elastic material 5 and an adhesion-preventing covering film 6 is passed through a steel tube 7 (except for the end portions of the member 3), and the space between the steel tube 7 and the steel center-axis force member 3 with the [abovementioned] deformation-absorbing elastic material 5 and adhesion-preventing covering film 6 is filled with concrete 8, so that a buckling confined diagonal brace member 10 is formed.

[0007] Where A_1 is the cross-sectional area of the portions of the aforementioned steel center-axial force member 3 consisting of the large-cross-sectional members 2, A_2 is the cross-sectional area of the portion [of the aforementioned steel center-axial force member 3] consisting of the small-cross-sectional member 1, L_2 is the length of the portion [of the aforementioned steel center-axial force member 3] consisting of the small-cross-sectional member 1, and L_1 is the length of the steel center-axial force member 3, the rigidity R and yield proof stress P_y of the buckling confined diagonal brace member can be expressed by the following equations:

$$R = \frac{E}{\frac{L_1 - L_2}{A_1} + \frac{L_2}{A_2}}$$

$P_y = \sigma_y \cdot A_2$

E: Young's modulus

σ_y: yield stress of steel

According to the above equations, even though there are limits to the stress of steel, R and P_y can be freely varied; accordingly, this [member] is extremely advantageous from the standpoint of design and vibration properties.

[0008] Figures 10 and 11 illustrate the conditions of use of the buckling confined diagonal brace member of the first embodiment of the present invention. Here, cruciform steel attachment fittings 12 are fastened by welding to upper and lower girders 11 in a steel-reinforced structure, and these steel attachment fittings 12 and the end portions of the aforementioned steel center-axial force member 3 are connected by means of steel coupling plates 13 and bolts 14.

[0009] Figures 12 through 14 illustrate a buckling confined diagonal brace member constituting a second embodiment of the present invention. Here, a steel center-axial force member 3 consisting of a flat-plate-form small-cross-sectional member 1 and respective flat-plate-form large-cross-sectional members 2 is used, and a deformation-absorbing elastic material 5 is fastened to inclined surfaces 4 which are formed on the end portions of the aforementioned large-cross-sectional members 2 that are adjacent to the small-cross-sectional member. The remaining construction is the same as in the case of the first embodiment.

[0010] Figures 15 through 17 show another example of a steel center-axial force member 3 that can be used to work the present invention. Here, trapezoidal cut-out parts 18 are formed in the intermediate parts (with respect to the direction of length) of the respective flanges 17 of a steel center-axial force member 3 consisting of an H-shaped steel member, so that a small-cross-sectional member 1 (positioned in the intermediate part of the steel center-axial force member 3), inclined surfaces 4 and large-cross-sectional members 2 are formed.

[0011]

[Merits of the Invention] In the present invention, [i] a steel center-axial force member 3 is constructed by connecting large-cross-sectional members 2 to both end portions of a

small-cross-sectional member 1, [ii] inclined surfaces 4 that form an obtuse angle with respect to the small-cross-sectional member 1 are formed on the end portions of the aforementioned large-cross-sectional members 2 that are located adjacent to the small-cross-sectional member, [iii] a deformation-absorbing elastic material 5 is fastened to the aforementioned inclined surfaces 4, [iv] an adhesion-preventing covering film 6 is formed on the portions of the aforementioned steel center-axial force member that are to be embedded in concrete, [v] the steel center-axial force member 3 on which the aforementioned deformation-absorbing elastic material 5 and adhesion-preventing cover film 6 have been installed is passed through a steel tube 7 except for the end portions of said member 3, and [vi] the space between the steel tube 7 and the steel center-axial force member 3 which has the [abovementioned] deformation-absorbing elastic material 5 and adhesion-preventing covering film 6 is filled with concrete 8. Accordingly, the variable rigidity and variable yield proof stress of the buckling confined diagonal brace member can be arbitrarily set. Furthermore, since the aforementioned inclined surfaces 4 form an obtuse angle with respect to the small-cross-sectional member 1, the cross-sectional area varies gradually between the small-cross-sectional member 1 and the large-cross-sectional members 2, so that the stress flow can be improved.

[Brief Description of the Drawings]

[Figure 1] Figure 1 is a side view which illustrates a buckling confined diagonal brace member constituting a first embodiment of the present invention.

[Figure 2] Figure 2 is a front view of the buckling confined diagonal brace member constituting a first embodiment of the present invention.

[Figure 3] Figure 3 is an enlarged sectional view along line A-A in Figure 1.

[Figure 4] Figure 4 is an enlarged sectional view along line B-B in Figure 1.

[Figure 5] Figure 5 is a side view which shows a steel center-axial force member equipped with a deformation-absorbing elastic material used in the first embodiment of the present invention.

[Figure 6] Figure 6 is a front view which shows the steel center-axial force member shown in Figure 5.

[Figure 7] Figure 7 is an enlarged side view of the intermediate part of Figure 5.

[Figure 8] Figure 8 is an enlarged sectional view along line C-C in Figure 7.

[Figure 9] Figure 9 is an enlarged sectional view along line D-D in Figure 7.

[Figure 10] Figure 10 is a side view which shows the conditions of used of the buckling confined diagonal brace member.

[Figure 11] Figure 11 is an enlarged side view of a portion of Figure 10.

[Figure 12] Figure 12 is a side view of buckling confined diagonal brace member constituting a second embodiment of the present invention.

[Figure 13] Figure 13 is an enlarged sectional view along line E-E in Figure 12.

[Figure 14] Figure 14 is an enlarged sectional view along line F-F in Figure 12.

[Figure 15] Figure 15 is a side view of another example of a steel center-axial force member that can be used in an embodiment of the present invention.

[Figure 16] Figure 16 is an enlarged sectional view along line G-G in Figure 15.

[Figure 17] Figure 17 is an enlarged sectional view along line H-H in Figure 16.

[Explanation of Symbols]

1 Small-cross-sectional member

2 Large-cross-sectional members

3 Steel center-axial force member

4 Inclined surfaces

5 Deformation-absorbing elastic material

6 Adhesion-preventing covering film

7 Steel tube

8 Concrete

9 Through-holes for the passage of bolts

10 Buckling confined diagonal brace member

11 Girders

12 Steel attachment fittings

13 Steel coupling plates

14 Bolts

15 Flat-plate part

16 Rib plate

17 Flanges

18 Cut-out parts

Figure 8

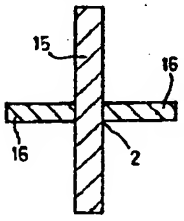


Figure 9

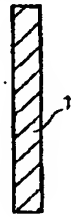
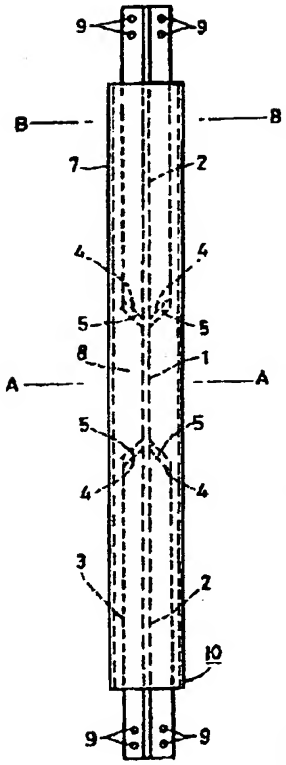


Figure 1



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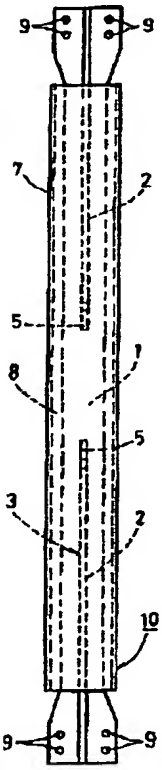

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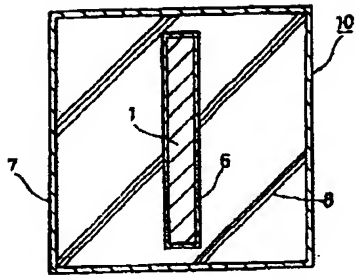


Figure 5

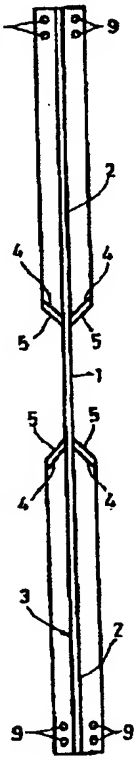


Figure 6

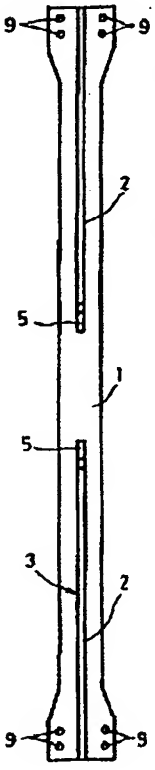


Figure 16

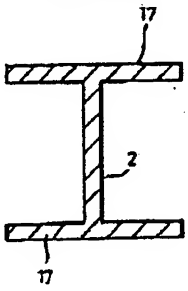


Figure 4

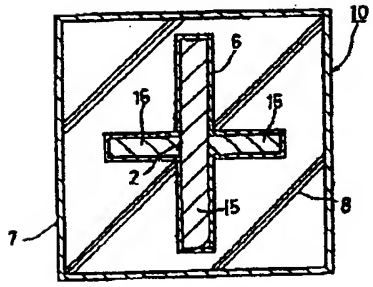


Figure 11

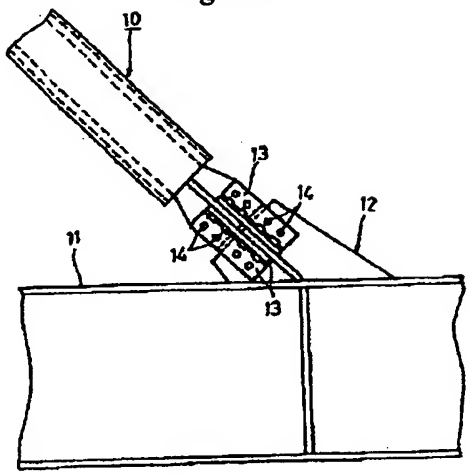


Figure 7

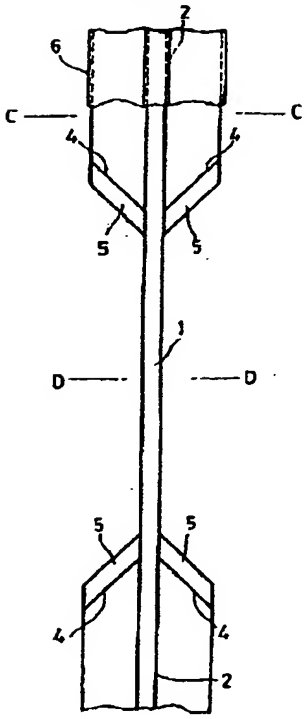


Figure 10

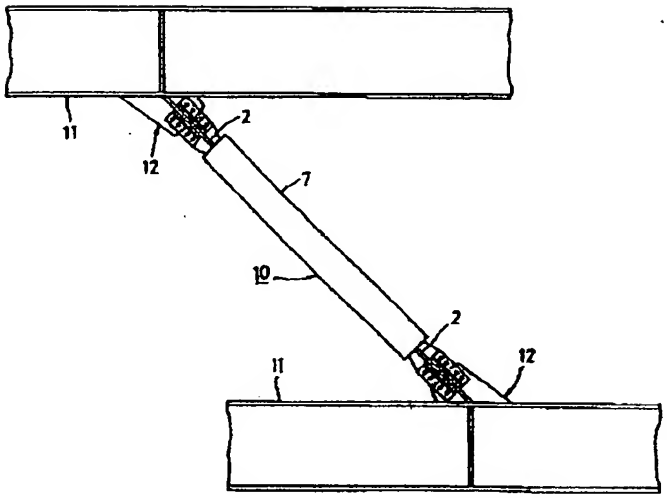


Figure 12

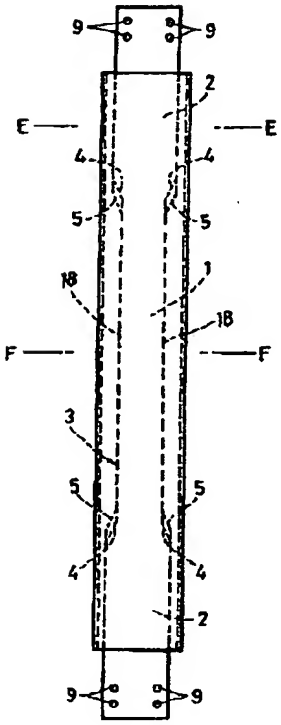


Figure 13

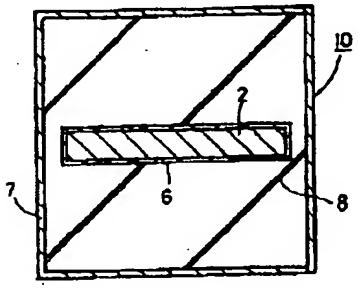


Figure 14

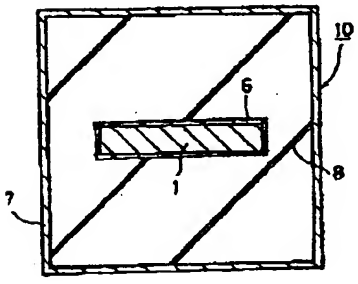
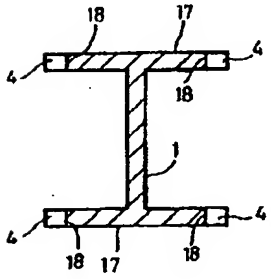


Figure 17



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-no US counterpart

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DIALOG(R)File 351:Derwent WPI

010431696 **Image available**
WPI Acc No: 1995-333016/199543
Buckling restraint bracing member for structure - fills concrete between centre axial force members which have elastomer and adhesion prevention film
Patent Assignee: NIPPON STEEL CORP (YAWA
Number of Countries: 001 Number of Patents: 001
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
JP 7229204	A	19950829	JP 9441753	A	19940217	199543	B

Priority Applications (No Type Date): JP 9441753 A 19940217
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
JP 7229204	A		6	E04B-001/24	

Abstract (Basic): JP 7229204 A
The buckling restraint bracing member comprises of the steel made center axial force member (3) articulating the large section member (2) to both ends of a longitudinal direction of a small section member (1). A slope (4) which forms an obtuse angle with the edge of the small section to the large section is installed. Elastomer (5) is fixed to the slope for transformation absorption. Also, adhesion prevention film is installed in the part laid with concrete in the steel made centre for axial force member. It is inserted in steel pipe (7) and concrete is filled except to the edge of the steel made centre axial force member which has elastomer for transformation absorption and adhesion prevention film.
ADVANTAGE - Sets arbitrarily rigidity and surrender yield strength. Provides resistance to earthquake and high wind force.
Dwg.2/17
Title Terms: BUCKLE ; RESTRAIN; BRACE; MEMBER; STRUCTURE; FILL; CONCRETE ; CENTRE; AXIS; FORCE; MEMBER; ELASTOMER; ADHESIVE; PREVENT; FILM
Derwent Class: Q43; Q46
International Patent Class (Main): E04B-001/24
International Patent Class (Additional): E04H-009/02
File Segment: EngPI